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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/511,860

10/18/2004

Peter Korner

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WARREN A. SKLAR (SOER)
RENNER, OTTO, BOISSELLE & SKLAR, LLP
1621 EUCLID AVENUE
19TH FLOOR
CLEVELAND, OH 44115

EXAMINER

FAULK, DEVONA E

ART UNIT

PAPER NUMBER

2615

MAIL DATE

DELIVERY MODE

11/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/511,860

Applicant(s)

KORNER, PETER

Examiner

Devona E. Faulk

Art Unit

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 9/4/2007, with respect to the rejection(s) of claim(s) 1-14 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of KSR rationale of obvious to try.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1,4,10 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishigami et al. (US 3,828,133) in view of Smith et al. (US 6,229,634).

Regarding **claim 1**, Ishigami discloses a device for increasing a perceived bandwidth in an audio signal path with limited bandwidth (abstract, Figure 1) comprising:

an input terminal for connecting an audio signal (input terminal 1, Figure 1);

an output terminal for connecting a speaker unit for generating an acoustic signal (switch 3, Figure 1);

a splitter adapted to divide the audio signal path from the input terminal into two branches (divider hybrid 4, Figure 1,), the branches comprising:

a first branch for passing a first part of the audio signal (Figure 1);

a second branch for processing a second part of the audio signal (Figure 1); and

wherein the second branch comprises means for producing harmonics of the audio signal (Figure 1, harmonic signal generator); and

a combiner for adding the harmonics produced in the second branch to the first part of the audio signal in the first branch at the output terminal (combiner hybrid 6, Figure 1); and

wherein the means for producing harmonics comprises a harmonic generator for producing harmonics (column 4, lines 53-59).

Ishigami fails to disclose producing out-of-band harmonics.

Smith discloses a limiter that produces out-of-band harmonics (column 4, lines 36-39). Smith fails to disclose adding the out-of-band harmonics to the signal.

The prior art, as evidenced by Ishigami, has recognized the benefits of adding harmonics to a signal. It would have been obvious to try adding out-of-band harmonics to a signal with a reasonable expectation of success in order to produce an improved sound.

Regarding claim 4, Ishigami as modified by Smith discloses wherein the harmonic generator comprises a nonlinear circuit (Figure 1).

Regarding claim 10, Ishigami as modified by Smith discloses that the audio signal is a speech signal (Ishigami, abstract).

Regarding claim 12, Ishigami as modified by Smith discloses wherein the device is used in a communication apparatus for increasing the bandwidth (Ishigami, column 2, lines 8-15, Figure 1).

5. **Claim 2,3,6, and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishigami et al. (US 3,828,133) in view of Smith et al. (US 6,229,634) in further view of Oda (US 5,923,766) in further view of Feremans et al. (US 5,828,755).

Regarding claim 2, Ishigami as modified by Smith discloses that the means for producing harmonics includes a filter and teaches of an amplifier that is not part of the harmonic generator. Ishigami as modified by Smith fails to disclose wherein the means for producing harmonics further comprises a filter. Oda disclose wherein the means for producing harmonics further comprises an amplifier (means for producing harmonics includes low pass filter full wave rectifier and amplifier Figure 1). It would have been obvious to modify Ishigami as modified by Smith so that the amplifier is part of the harmonic generator in order to amplify the harmonics produced.

Ishigami as modified by Smith and Oda fail to disclose that the amplifier is adjustable. Feremans discloses an adjustable amplifier (column 4, lines 45-47). It

would have been obvious to modify Ishigami as modified by Smith and Oda to make the amplifier adjustable so that the user can control the level of the audio output.

Regarding claim 3, Ishigami as modified by Smith and Oda discloses wherein the filter is arranged to separate an upper portion of a pass band as an input to the harmonic generator (low pass filter 1 reads on the claim language, Figure 1).

Regarding claim 6, Ishigami as modified by Smith discloses adding harmonics. Ishigami as modified by Smith fails to disclose adding second harmonics. Oda discloses wherein the means for producing harmonics is arranged to add second harmonics (full wave rectifier and low pass filter no. 2, Figure 1; column 4, lines 53-59). It would have been obvious to modify Ishigami as modified so to add second harmonics in order to produce an improved output signal.

Regarding claim 7, Ishigami as modified by Smith discloses adding harmonics. Ishigami as modified by Smith fails to disclose adding even harmonics. Oda discloses wherein the means for producing harmonics is arranged to add even harmonics (column even harmonics in order to produce an improved output signal.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishigami et al. (US 3,828,133) in view of Smith et al. (US 6,229,634) in view of Oda (US 5,923,766) in further view of Runton et al. (US 6,865,430) .

Regarding claim 5, Ishigami as modified by Smith and Oda discloses a harmonic generator. Ishigami as modified by Smith and Oda fails to disclose that the harmonic generator comprises a digital signal processor DSP. Runton discloses a harmonic

generator that comprises a digital signal processor (Figure 2, abstract; column 1, line 62-column 4, lines 17). It would have been obvious to modify Ishigami as modified so that the harmonic generator comprises a digital signal processor in order to provide the capability of real-time processing and processing of digital signals.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishigami et al. (US 3,828,133) in view of Smith et al. (US 6,229,634) in view of Townsend et al. (US 6,606,388).

Regarding claim 11, Ishigami as modified by Smith discloses a first branch. Ishigami as modified by Smith fails to disclose that the first branch includes a delay or a phase shift. Townsend discloses a method and system for enhancing audio signals including a first branch comprising a delay (Figure 2). It would have been obvious to modify Ishigami as modified to include a delay in the first branch in order to ensure that the high frequency and low frequency signals stay aligned.

8. Claim 8,9,13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishigami et al. (US 3,828,133) in view of Smith et al. (US 6,229,634) in further view of Mousty et al. (US 2001/0034252).

Regarding claim 8, Ishigami as modified by Smith teaches of an audio signal. Ishigami discloses wherein the audio signals can be from a telephonic audio signal including speech (column 1, lines 5-15). Ishigami as modified fails to disclose that the audio signal is a ring. A telephonic audio signal can obviously ring. Mousty discloses a portable telephone wherein the input audio can be a ring or a GSM signal (paragraph 0002 and 0022). It would have been obvious to modify Ishigami as modified by Smith

by y having the audio signal be a ring or speech signal such as GSM in order to be able to provide harmonic enhancement to various types of audio signals.

Regarding claim 9, Ishigami as modified by Smith and Mousty discloses an audio signal and that the audio signal can be a telephonic audio signal that is a ring. Ishigami as modified by Smith and Mousty fail to disclose that the audio signal is a polyphonic ring signal. It is known in the art that mobile phones can produce polyphonic ring tones. It would have been obvious to modify Oda as modified by Case so that the telephonic signal is a polyphonic ring signal in order to provide harmonic enhancement to various types of audio signals.

Regarding claim 13, Ishigami as modified by Smith and Mousty discloses the device being used in a communication apparatus comprising: a polyphonic sound effect generator for producing the polyphonic ring signal. A polyphonic sound effect generator is implicit. All elements of claim 13 are comprehended by the rejection of claim 9.

Regarding claim 14, Ishigami as modified by Smith and Mousty discloses that the device being used in a communication apparatus wherein the communication apparatus is a portable telephone, a pager, a communicator or an electronic organizer. All elements of claim 14 are comprehended by the rejection of claim 13.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Devona E. Faulk whose telephone number is 571-272-7515. The examiner can normally be reached on 8 am - 5 pm.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DEF


VIVIAN CHIN
SUPERVISOR PATENT EXAMINER
TECHNOLOGY CENTER 2000